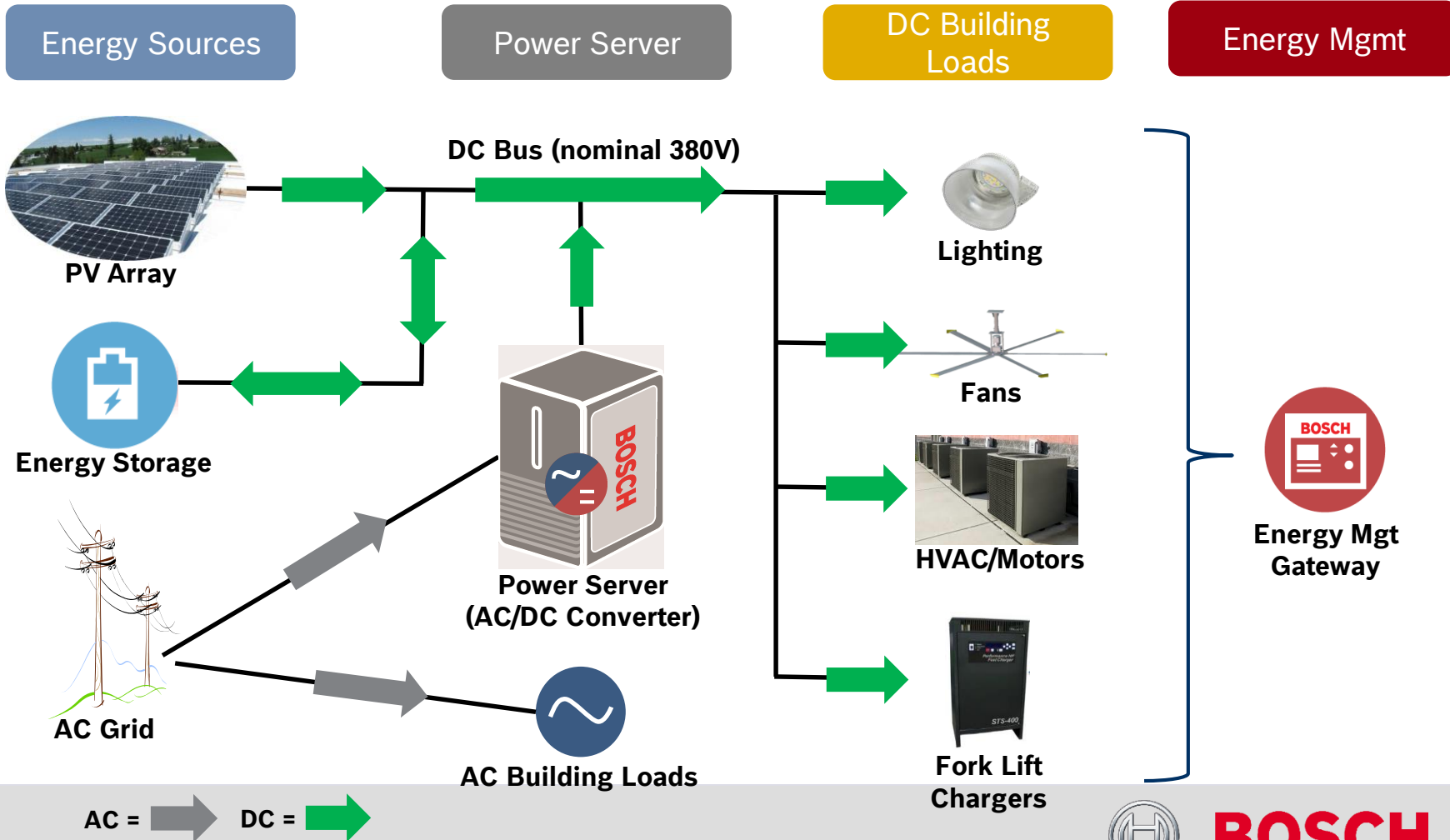


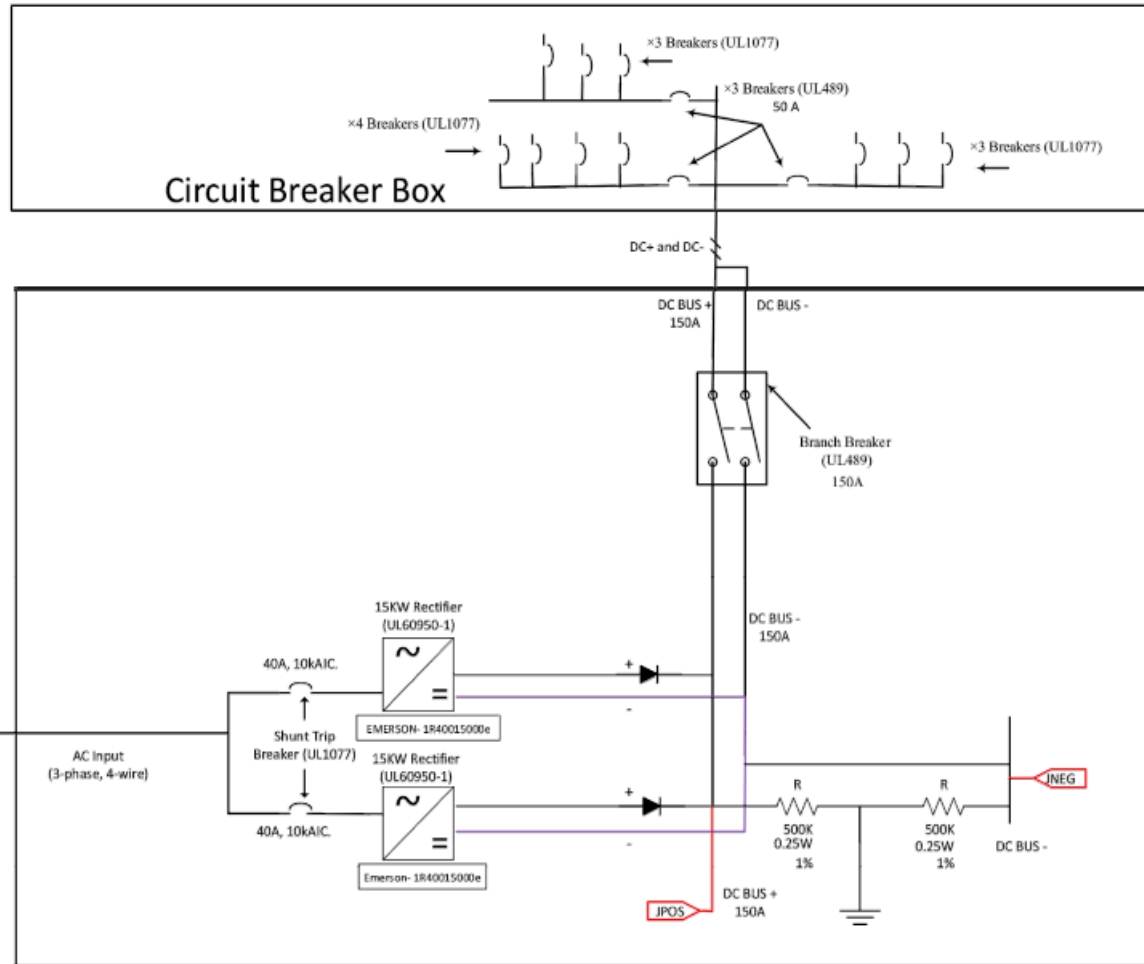
Bosch DC Microgrid Configuration (Non-Export)



BOSCH

Details of the Bosch Power Server

- Acquiring UL 1741 certification as a converter per UL's guidance
- Rectifiers are primary component that provide only one way flow (AC to DC)
- Includes redundant layers of protection surrounding rectifiers in case of catastrophic failure



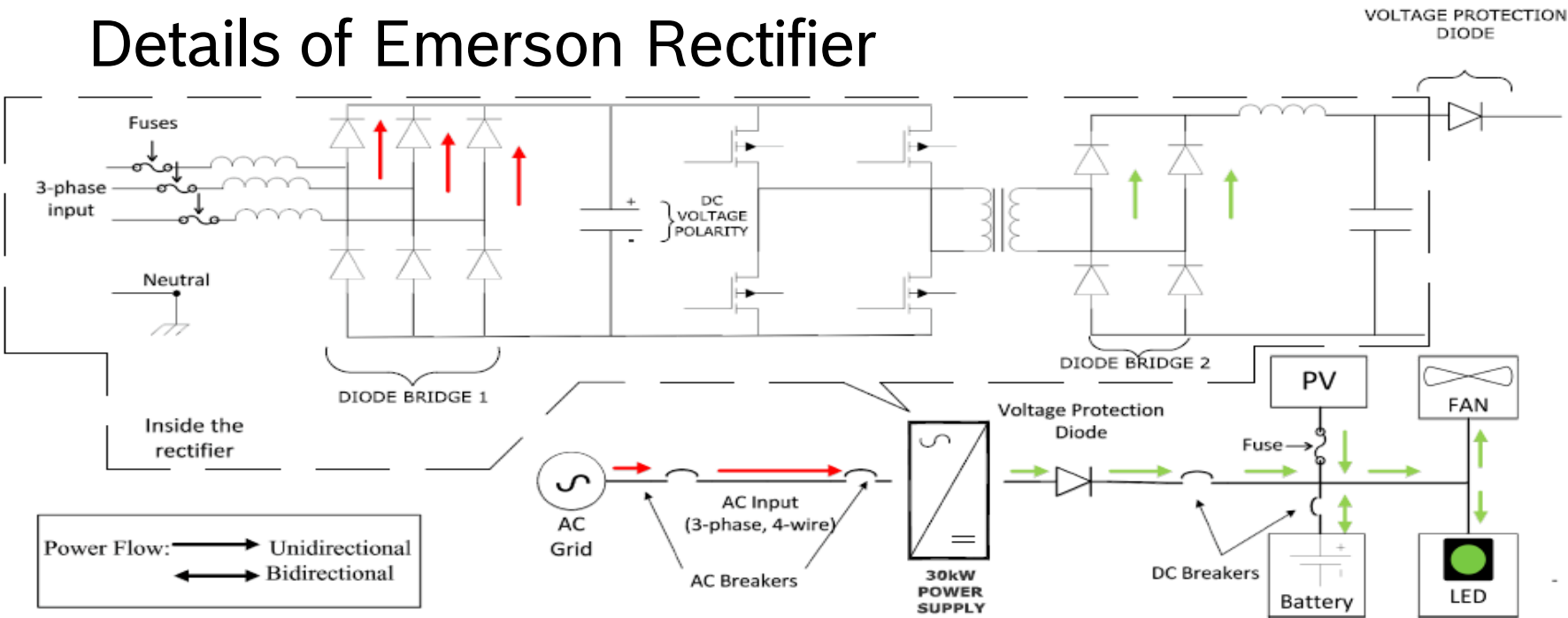
Power Server



BOSCH



Details of Emerson Rectifier

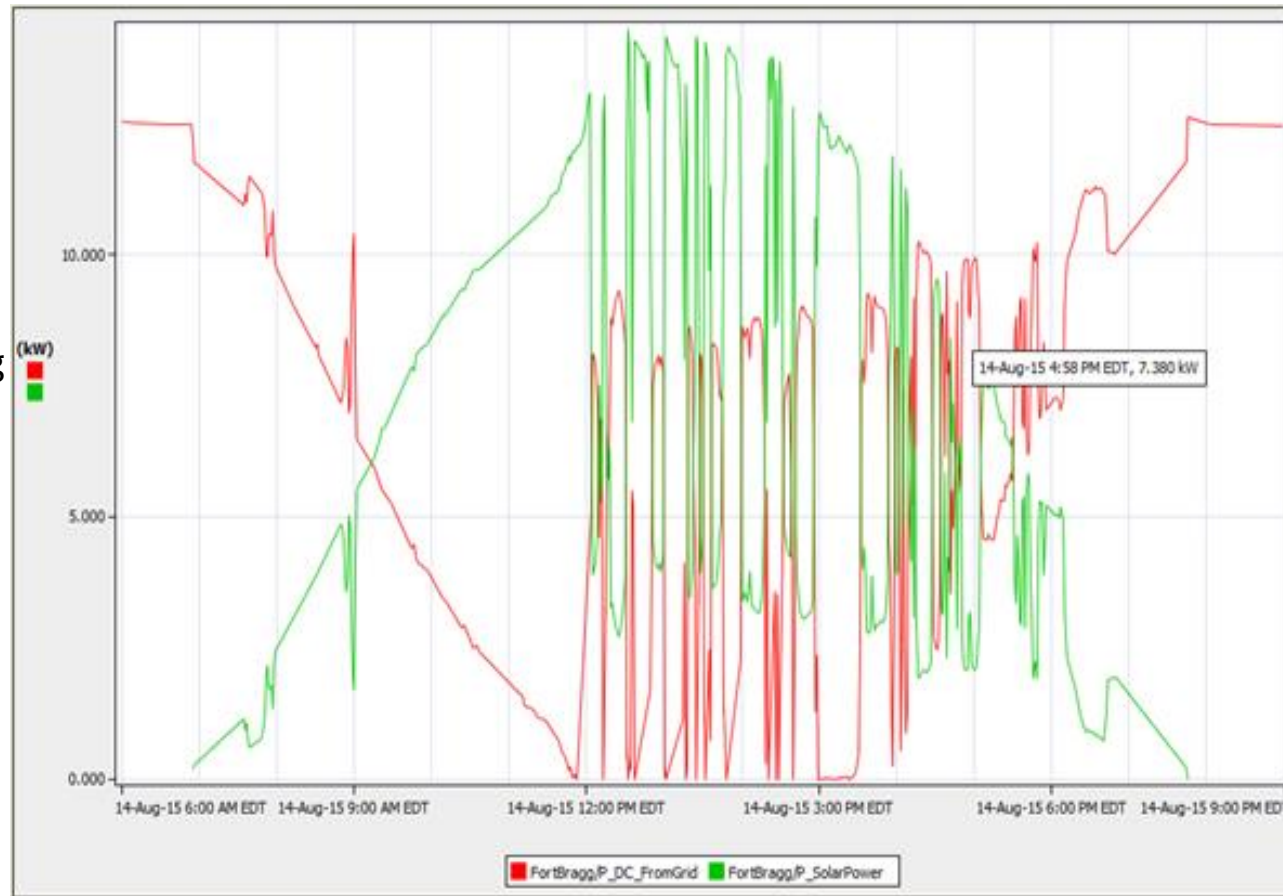


- ➔ Using off the shelf Emerson rectifiers
 - UL 60950-1 certified (Information Technology Equipment Safety)
 - Includes multiple diode bridges that prevent reverse power flow
 - Contains galvanic isolation between the AC mains voltage and DC output (no physical electrical connection)
 - UL 60950-1, Section 1.4.14: Abnormal internal rectifier fault testing to ensure primary to secondary isolation boundary is not violated. Pass electric strength test after each fault test.
- ➔ Similar architecture to DC data centers with batteries
 - DC energy remains electrically isolated from AC mains via rectifier construction



Test Data of PV Generation

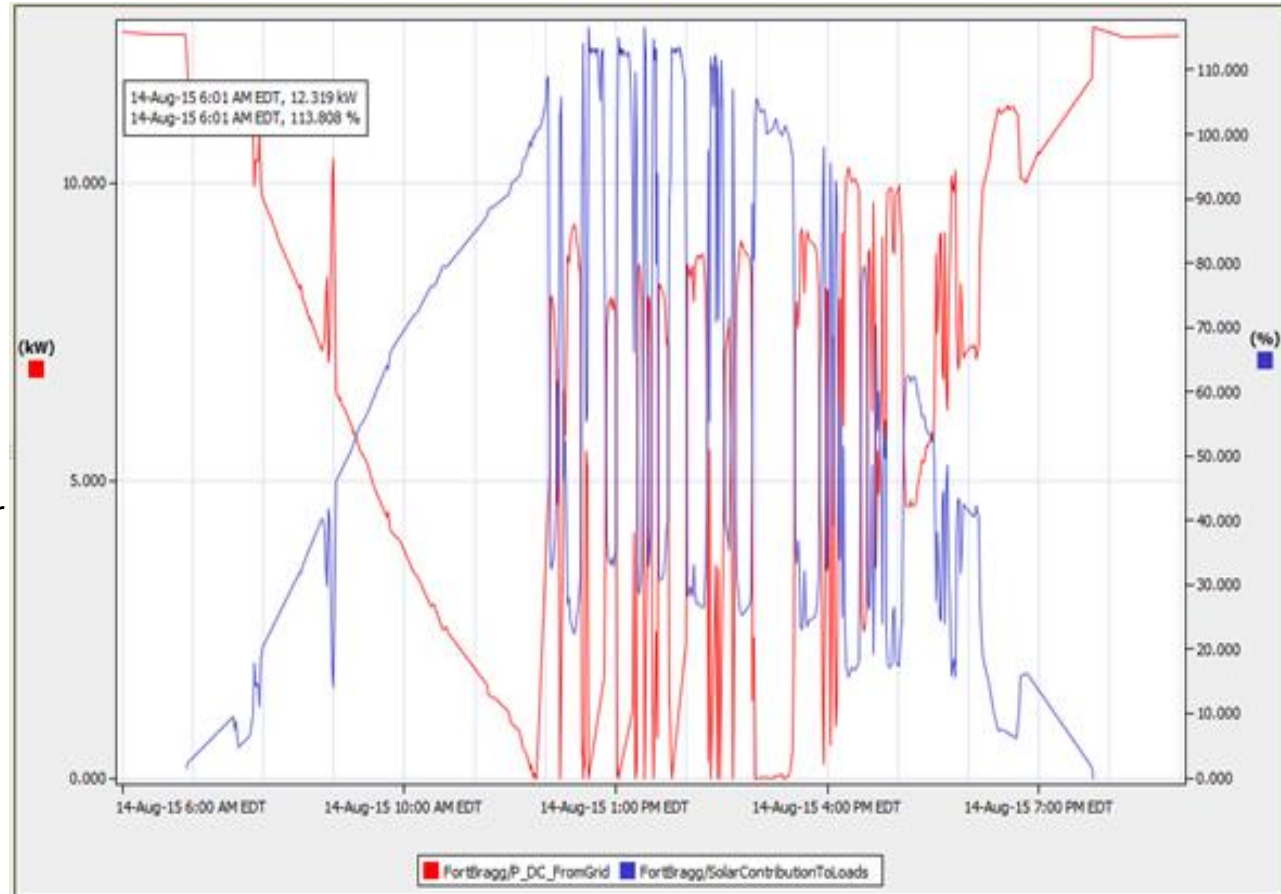
- Red line is AC power to the rectifiers
- Green line is DC power generated from PV going to the loads
- Inverse relationship between AC power from the grid and DC being generated by PV.



BOSCH

Test Data of Non-Export Function

- Red line is AC power to the rectifiers
- Blue line is percent PV being generated compared to the DC loads
- At 110% PV (more solar power than DC loads) we never export anything to the grid.



BOSCH

Bosch Non-Export Storage Proposal

- ➔ Rule 21 should not apply for BTM/NE* Storage where export is a physical impossibility
 - Technical review is unnecessary

C. DEFINITIONS

...Non-Export; Non-Exporting: When the Generating Facility is sized and designed such that the Generator output is used for Host Load only and is designed to prevent the transfer of electrical energy from the Generating Facility to Distribution Provider's Distribution or Transmission System as described in Section M. ***Where the transfer of electrical energy from the Generating Facility to Distribution Provider's Distribution or Transmission System is a physical impossibility, a facility does not meet the definition of a Generating Facility or a Non-Export Generating Facility.***

* Behind the meter non-exporting



Bosch Non-Export Storage Proposal (Cont'd)

- If Rule 21 applies, streamline application for DC systems where export is a physical impossibility
- Waive or significantly reduce \$800 Interconnection fee
 - Add definition for AC/DC converter in Section C
 - AC/DC Converter: A one-way only device that takes alternating current power from the Distribution System and converts it into direct current power for direct current loads in a facility, without allowing direct current power to be exported to the Distribution System
 - Screens F, G, I, M, N, and O should be not applicable if AC/DC converters are installed instead of inverters
 - Screen I: includes a new option for devices physically impossible of exporting
 - Section H: Add AC/DC converters as a new generating facility
 - Modify Interconnection forms allowing AC/DC converters in place of inverters
 - Part 3c
 - Part 4

